UNITED STATES DEPARTMENT OF LABOR MINE SAFETY AND HEALTH ADMINISTRATION Metal and Nonmetal Mine Safety and Health

REPORT OF INVESTIGATION

Surface Nonmetal Mine (Construction Sand and Gravel)

Fatal Powered Haulage Accident March 8, 2016

Staker & Parsons Companies
Beck Street South
Salt Lake City, Salt Lake County, Utah
MSHA I.D. 42-00410

Investigators

Joseph L Summers Mine Safety and Health Inspector

Kent L Norton

Mine Safety and Health Specialist (Training)

Ronald Medina

Mine Safety and Health Specialist, Mechanical Engineer
(Mechanical & Engineering Safety Division)

Originating Office

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OVERVIEW

Blaine Kirk Linck, Haul Truck Driver, age 54, was fatally injured on March 8, 2016. Mr. Linck was operating a haul truck when it traveled beyond the dump site berm and down a slope, about 80 feet, coming to rest in 14 feet of water.

The accident occurred because mine management failed to ensure that the victim maintained control of the truck he was operating at all times and failed to ensure that the victim was wearing a seat belt.

GENERAL INFORMATION

Beck Street South, a surface sand and gravel mine, is owned and operated by Staker & Parsons Companies and is located in Salt Lake City, Salt Lake County, Utah. The principal operating official is Travis Canfield, General Manager. The mine employs twenty-five persons and operates two, eight-hour shifts, five to six days per week.

Sand and gravel is drilled and blasted from a multiple bench quarry. The operator uses a track excavator to load haul trucks, which then transport broken rock and gravel to the onsite plant for crushing and sizing. The final product is sold for use in the construction industry.

The Mine Safety and Health Administration (MSHA) completed the last regular inspection at this operation on February 18, 2016.

DESCRIPTION OF ACCIDENT

Blaine Kirk Linck, a Haul Truck Driver for Beck Street South, reported for work at 4:00 p.m. Linck attended the regularly scheduled safety meeting and was assigned by Neilo Taylor, Lead Man, to operate a Caterpillar 775E truck. Linck and Gary Erickson, Haul Truck Driver, were assigned to haul reject material from an upper bench to the north dump site. After conducting a pre-operational inspection of his haul truck, Linck began hauling material.

At about 9:00 p.m., Clint Leek, Front-end Loader Operator, was conducting a sweep of the haul road and noticed that a truck had travelled onto a berm on the uphill side of road. Leek called on the radio to find out who had hit the berm. After neither haul truck driver answered, Taylor joined the inquiry by radio. Linck radioed that he had hit the berm and stated that he and the truck were ok.

At approximately 10:45 p.m., Erickson noticed that Linck had been absent for a while. Erickson attempted to contact Linck on the radio, but was unsuccessful. Erickson contacted Taylor, and Taylor ordered an immediate physical search for Linck. While Erickson was searching at the dump site, he spotted Linck's truck at the bottom of the dump partially submerged.

Taylor proceeded to the bottom of the dump, traveling to the water's edge, and yelled for Linck. After failing to get a response, Taylor swam out to the truck and entered the truck from the driver's side window. Linck was lying across the cab, face down in the water.

Leek swam out to assist, and Taylor and Leek extricated Linck from the truck. Taylor and Leek tied Linck to a life ring and pulled him to the shore where they initiated CPR. At 11:08 p.m., Erickson contacted Emergency Management

Services. Linck was pronounced dead at the scene by the paramedics. Cause of death was attributed to drowning. Manner of death was accidental.

INVESTIGATION OF THE ACCIDENT

Jory Argyle, Division Safety Manager, notified MSHA of the accident at 11:19 p.m. on March 8, 2016, by a telephone call to the Department of Labor's National Contact Center (DOLNCC). The DOLNCC notified Pete Del Duca, Staff Assistant, and an investigation began the same day. An order was issued under the provisions of Section 103(k) of the Mine Act to ensure the safety of the miners when the first Authorized Representative arrived at the mine.

MSHA's accident investigation team traveled to the mine site, made a physical inspection of the accident scene, interviewed employees and reviewed conditions and work procedures relevant to the accident. MSHA conducted the investigation with the assistance of mine management and mine employees.

DISCUSSION

Location of the Accident

The accident occurred at the north dump site, located immediately adjacent to the gyro crusher. The company was loading reject material from an upper bench with a Caterpillar 390 D, track excavator into two, Caterpillar 775 E, haul trucks. The round trip for haulage was approximately 1.5 miles. The reject material was being dumped at the north dump site, short of the berm, and pushed over the berm with a Caterpillar 980 K, front end loader.

Equipment

- 1. General Machine Information: The machine involved in the accident was a Caterpillar Model 775E, rigid frame, 70–ton, nominal rated payload capacity, off-highway truck. The truck was powered by a Caterpillar Model 3412E, 27 liter, turbocharged and aftercooled diesel engine. The truck was 30' 3" long, had a 14' 8" wide wheelbase and was 14' 6" high. The Caterpillar-rated maximum gross machine weight was 239,000 lbs., and the nominal Caterpillar payload capacity was 140,000 lbs.
- 2. Machine Damage: The truck was under water from March 8, 2016 to March 23, 2016, while a road was built to allow recovery. After an initial inspection, the mud covering the truck was hosed off to allow further testing. The outside of the driver side door, on the left side of the truck, was damaged in the accident and was found open. It did not latch shut when attempts were made to close it. The inside and outside passenger side door handles functioned to open the passenger side door. The driver side window, windshield, and rear window were broken. There was little damage inside the operator's compartment and no cab deflection into the

operator's space. The left and right side mirrors, and the ladder and platform on the left side of the truck were visibly damaged. The backup light housings were half full of water. Subsequent testing showed that the electrical system was damaged. The engine was not operational due to the damage.

- 3. **Brake Systems and Retarder System Overview**: The truck was equipped with a service brake, a secondary brake, a parking brake, and a retarder.
 - a. Service Brake System Design and Testing: A foot-operated valve controlled a dual circuit, air-over-hydraulic oil service brake system; one circuit for the front, dry caliper-disc brakes and another circuit for the rear, wet disc brakes. A switch on the dash panel allowed the operator to enable or disable the front service brakes. The front service brake switch was found in the Front-Brakes-Not-Enabled position. The service brake foot pedal moved freely through its range of motion and returned to the "brake released" position when foot pressure was released. The front axle brake discs and brake linings were clean and dry and exceeded the minimum thicknesses specified by Caterpillar for the 775E truck. No braking system leaks were found. No service brake deficiencies were found when pressure tests were performed on the system.
 - b. Secondary Brake System Design and Testing: The truck was equipped with a foot pedal on the left side of the service brake pedal to provide modulated secondary braking. The secondary brake can be used to stop the truck if there is any single failure in the service brake system by applying the same rear—axle, multidisc wet brakes used for the service brakes. The secondary brake control pedal was found in the released position when the truck was recovered. It moved freely and returned to the "OFF" position when released. No secondary brake deficiencies were found when pressure tests were performed on the system.
 - c. Parking Brake Design and Testing: The truck was equipped with an ON-OFF hand control switch for the parking brake. The truck was also equipped with a parking brake reset valve button on the transmission control console. The parking brake was also designed to automatically actuate if the air pressure dropped below 60 psi. After the truck was recovered, the parking brake switch was found in the "OFF" position. The park brake reset button was in the "UP" position. These controls moved freely and there was no visible damage. Pressure tests indicated proper operation of the parking brake control valve.

- d. **Retarder System Design and Testing**: The truck was equipped with a hand control lever on the right side of the steering column to provide vehicle retarding. The retarder control gradually provides air pressure to the rear service brake master cylinder to proportionally apply (modulate) only the rear service brakes. Pressure tests indicated proper operation of the retarder system.
- 4. Caterpillar Electronic Technician Service Tool: The truck was equipped with an onboard Caterpillar Electronic Technician diagnostic/service tool. The truck was not equipped with a data logging device that would record operator control positions. An attempt was made to recover any possible data available from the Electronic Control Module, but damage to the electrical system prevented accessing any data.
- 5. **Throttle Pedal Inspection**: The throttle pedal operated smoothly and returned to the low idle position when it was released.
- 6. **Transmission Design and Inspection**: The truck had an electronically controlled, automatic transmission with seven forward speeds, neutral, and one reverse. A single-lever shift control provided automatic shifting up to the one selected by the control lever. The gear selector control was found in neutral and the transmission rotary selector spool, which controls the transmission clutch pressures, was also found in neutral. Investigators were not able to determine if the gear shift controller was bumped while the truck was still running as it traveled down the embankment.
- 7. Reverse Neutralizer Design and Inspection: The truck was equipped with a dump body position sensor. It consisted of a Down/Up switch located on a bracket on the rear frame and a corresponding magnet assembly that was attached to the dump body. If the dump body is raised and the transmission is in reverse, the transmission will shift into neutral. The transmission will not shift into reverse until the body is lowered completely and the transmission control is moved back into neutral and then into reverse. The body Down/Up switch indicated proper operation when it was removed and tested.
- 8. **Steering System Design and Inspection**: The truck was equipped with a separate hydraulic system for the steering system. The steering linkage was inspected and all the steering components were intact.
- 9. **Back-up Lights**: After the truck was recovered, the lamps were removed from the two backup lights and they functioned when powered by a 24 volt source.
- 10. **Rear Camera**: The truck was equipped with a back-up camera and a display monitor in the operator's cab. The display monitor in the cab was

damaged as a result of the accident. The rear facing camera was removed from the accident truck and installed on another Cat 775E truck that was equipped with the same back up camera and display monitor system. The camera fully functioned when tested.

- 11. Proximity Detection: The truck was also equipped with a rear facing proximity detection radar unit that was designed to alert the driver when the truck approached objects behind the truck. The radar unit was removed from the accident truck and was installed on another Cat 775E truck. It did not function and water was dripping from the radar unit housing. Investigators were not able to determine the operation of the radar unit prior to the accident.
- 12. **Seat Belt**: The seat belt latched and unlatched when tested.

Equipment Summary

The braking systems, retarder, throttle pedal, dump body position sensor, steering system, back up lamps, and rear facing camera, were inspected and tested and no defects were found. The seat belt latched and unlatched when tested.

Weather

On the evening of the accident, average temperature was 44F. Conditions were overcast with wind speeds of 10 mph. Sunset was at 6:27 pm with a new moon. Weather was not considered to be a factor in the accident.

TRAINING AND EXPERIENCE

Blaine Kirk Linck had five years of mining experience. He had four months of experience at his regular duties as a haul truck operator. A representative of MSHA's Educational Field and Small Mines Services conducted an in-depth review of the mine operator's training records for Linck. The records were found to be up to date and in compliance with MSHA requirements.

ROOT CAUSE

A root cause analysis was conducted and the following root causes were identified:

Root Cause: Management failed to ensure that the operator maintained control of his equipment.

Corrective Actions: Management retrained all equipment operators in maintaining control of equipment while in operation.

Root Cause: Management failed to ensure that the operator wore a seat belt while operating mobile equipment.

Corrective Action: Management retrained all equipment operators in the use of seat belts while operating mobile equipment.

CONCLUSION

The accident occurred due to managements' failure to ensure that equipment operators maintain control of their equipment and wear seat belts at all times.

ENFORCEMENT ACTIONS

Order No. 8931031- Issued on March 9, 2016, under the provision of Section 103(k) of the Federal Mine Safety and Health Act of 1977:

A fatal accident occurred at this operation on March 8, 2016. A haul truck operator over traveled a berm and traveled down an 80 foot dump site landing in 14 feet of water. This order is issued to assure the safety of all persons at this operation. It prohibits all activity at the feed bench and haul road until MSHA has determined that it is safe to resume normal mining operations in the area. The mine operator shall obtain prior approval from an authorized representative for all actions to recover and/or resume operations to the affected area.

<u>Citation No. 8942613</u> - Issued under the provisions of Section 104(a) of the Mine Act for violation of 56. 14131(a):

A fatal accident occurred at this operation on March 8, 2016 when an equipment operator operating a haul truck over travelled through a berm and off a dump site into a partially flooded pit. The equipment operator was not wearing a seat belt at the time of the accident.

Citation No. 8942614 - Issued under the provisions of Section 104(a) of the Mine Act for violation of 56.9101:

A fatal accident occurred at this operation on March 8, 2016 when an equipment operator operating a haul truck over travelled through a berm and off a dump site into a partially flooded pit. The equipment operator did not maintain control of the haul truck. There were no signs of evasive or corrective actions taken by the haul truck operator to maintain control of the haul truck.

Approved By:

Richard Laufenberg **District Manager**

Date

APPENDIX A

Persons Participating in the Investigation

Staker & Parsons Companies

Dan Arnoldson

Region Safety Manager, Staker & Parson

Jory Argyle

Division Safety Manager

Travis Canfield

General Manager

Matt Wilson Neilo Taylor Site Foreman

Jeremy Speas

Lead Man/Operator Safety and Health Specialist

Craig Hall

Legal Representation

Wheeler Cat

Ed Fisher

Caterpillar Technician

Jim Smith Jon Jones Caterpillar Technician

Caterpillar Technician

Mine Safety and Health Administration

Joseph Summers

Mine Safety and Health Inspector

Ron Medina

Mechanical Engineer

Kent Norton

Mine Safety and Health Specialist (Training)

APPENDIX B

Victim Information

Accident Investigation Data - Victim Information Event Number: 6 6 9 7 4 5 9					U.S. Department of Labor Mine Safety and Health Administration								
Victim Information: 1					_			<i>y</i>					
Name of Injured/III Employee:	2. Sex 3. Victim	ictim's Age 4. Degree of											
Blaine K. Linck	M 54		01 Fat	a/									
5. Date(MM/DD/YY) and Time(24 Hr.) Of Death.					e and Tim	ne Started:				*			
a. Date: 03/08/2016 b.Time: 23:11					a. Date: 03/08/2016 b.Time:16:00								
7. Regular Job Title:	8. Work Activity when I				ijured:				9. Was this work activity part of regular job?				
176 Haul Truck Driver	055 Dин	055 Dumping material at dump site						Yes	X No	. 1			
10. Experience Years Weeks a. This	Days b. Regular	Years	Weeks	Days	c: This	Years	Weeks	Days	d. Total	Years	Weeks	Days	
Work Activity: 0 17	2 Job Title:	0	17	2	Mine:	0	17	2	Mining:	5	8	5	
11. What Directly Inflicted Injury or Illness?						e of injury o	or liness:						
110 Haul Truck					110	Drownina							
13. Training Deficiencies:								-					
Hazard: New/Newly-Employed Experienced Miner:						Annual:		Task:	1.1				
14. Company of Employment: (If different	from production opera	ator)					·						
Operator						In	dependent	Contractor IE): (if applic	able)			
15. On-site Emergency Medical Treatmen	t:												
Not Applicable: First-Aid	1: x c	PR: X	EMT:	x	Medi	ical Profess	sional	None:	1 1				
16. Part 50 Document Control Number: (fo	orm 7000-1)		1	7. Unio		n of Victim			(No Union	Affiliation)			

APPENDIX C

Accident Scene Photographs

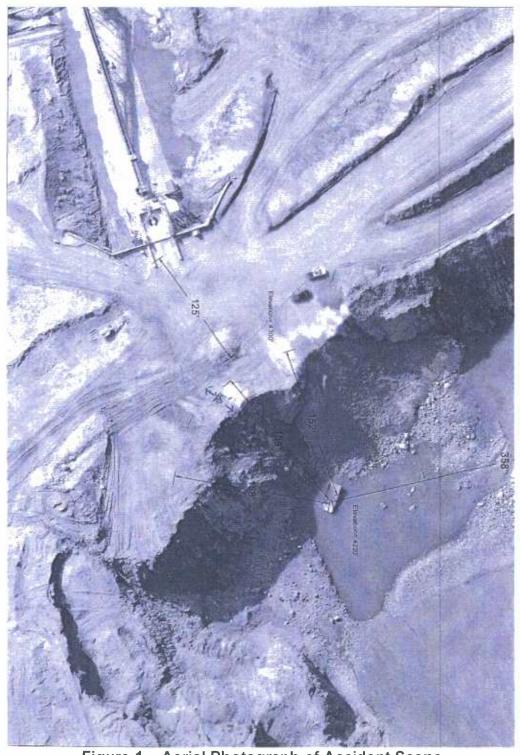


Figure 1 – Aerial Photograph of Accident Scene



Figure 2 – Driver Side of Haul Truck



Figure 3 – Bottom of Dump Site Looking Up



Figure 4 – Top of Dump Site Looking Down



Figure 5 – Dump Site Berm Where Haul Truck Travelled Thru